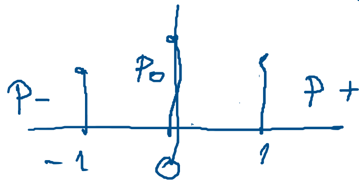
# Erik 2024-05-03

Friday, May 3, 2024 4:42 PM

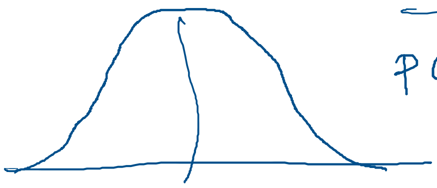



$$z = \begin{cases} -1, & p_- \\ 0, & p_0 \\ 1, & p_+ \end{cases}$$

$\bar{z}$ stř. hodnota

$$\text{var}\, z = \langle (z-\bar{z})^2 \rangle$$

$$p(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$



1 krok $p(x)$

N kroků

$$\underbrace{p \circ p \circ \dots p}_{N} = p^{\circ N}$$

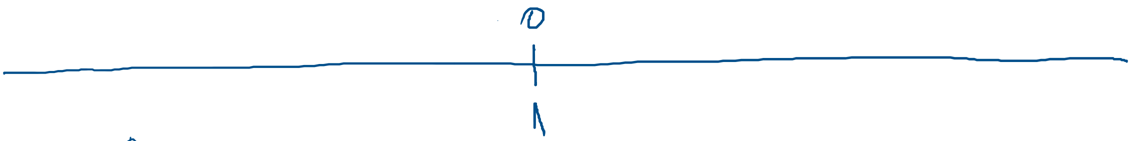
$$p_+ = p_0 = p_- = \frac{1}{3}$$

$\bar{z} = 0$, var $z$ =

$$\text{var}\, z = \langle (z-\bar{z})^2 \rangle =$$

$$= \frac{1}{3}\cdot(-1)^2 + \frac{1}{3}\cdot(0)^2 + \frac{1}{3}(1)^2 =$$

$$= \frac{2}{3} \qquad 2\,\frac{p_+ + p_-}{2}$$



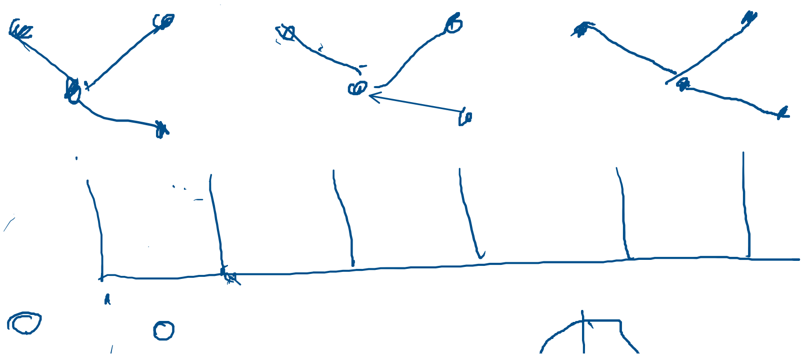


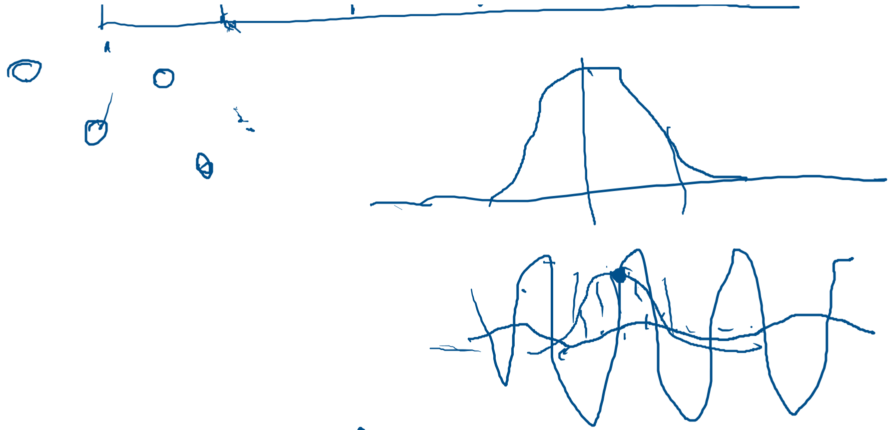
$\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$

$\frac{1}{9}$ $\frac{2}{9}$ $\frac{3}{9}$ $\frac{2}{9}$ $\frac{1}{9}$

$\frac{1}{27}$ $\frac{3}{27}$ $\frac{6}{27}$ $\frac{7}{27}$ $\frac{6}{27}$ $\frac{3}{27}$ $\frac{1}{27}$

$\frac{1}{81}$ $\frac{4}{81}$ $\frac{10}{81}$ $\frac{16}{81}$ $\frac{19}{81}$ $\frac{16}{81}$ $\frac{10}{81}$ $\frac{4}{81}$ $\frac{1}{81}$

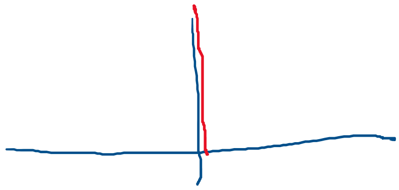


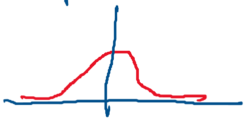


$$y'(x) = \int w(x-x')\, y(x')\, dx'$$

Konvolúca

$p(x)$ $\qquad P(x,0)$





$$P(x, n+1) = \int p(x-x')\, P(x', n)\, dx'$$

$$\Sigma$$

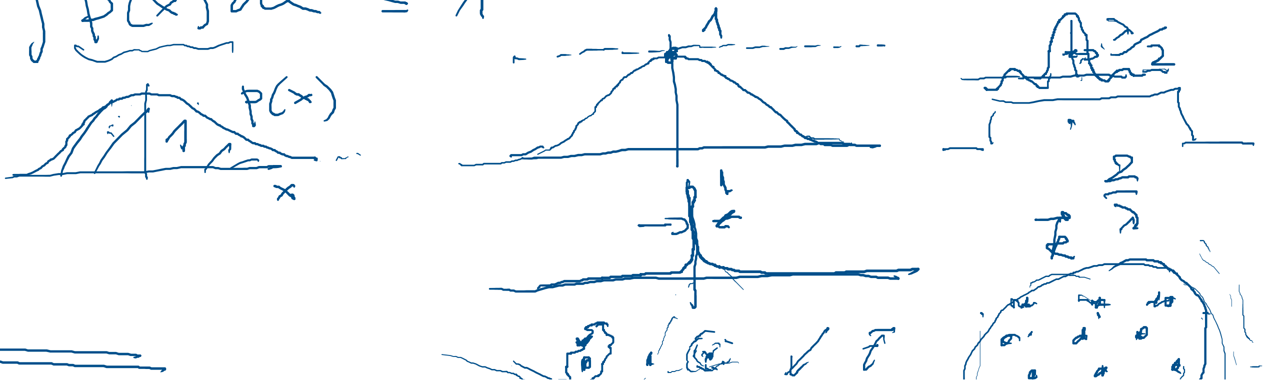
$$y(x) \longrightarrow \bar{y}(k) = \int e^{-ikx}\, y(x)\, dx$$

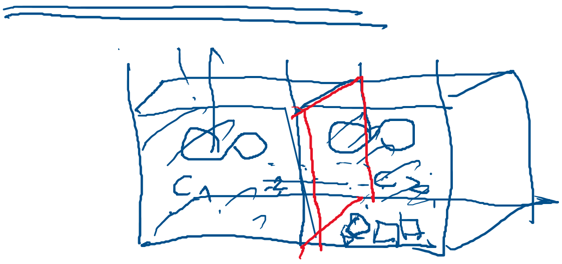
$$\bar{P}(k, n+1) = \bar{p}(k)\, \bar{P}(k, n)$$

$$= \underbrace{\bar{p}(k)^{n+1}} \bar{P}(k, 0)$$

$$\bar{p}_k = \underbrace{\int e^{-ikx}\, p(x)\, dx}$$

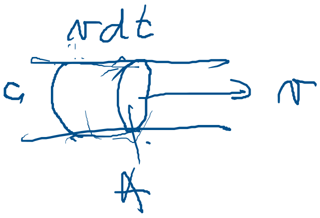
$$\bar{p}_0 = \int \underbrace{p(x)}\, dx = 1$$





Tok častíc : $\dfrac{(\text{počet častíc})}{(1\ \text{plochy})(1\ \text{času})} = \dfrac{dN}{A\,dt}$

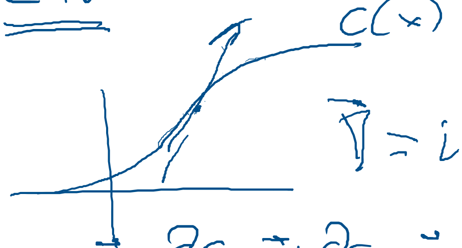
$J$



$$dV = A v\, dt$$

$$dN = c\, dV = A c v\, dt$$

$$\underline{J} = \frac{dN}{A\,dt} = \underline{\underline{c v}}$$



$$\nabla = i\frac{\partial}{\partial x} + j\frac{\partial}{\partial y} + k\frac{\partial}{\partial z}$$

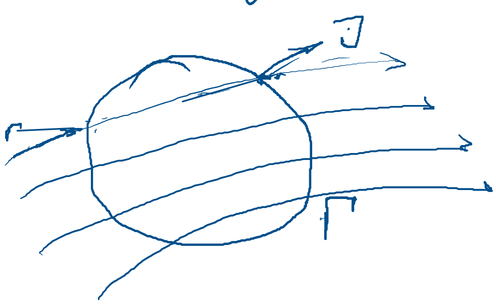
$$\boxed{J_D = -D \operatorname{grad} c}$$

Fickov zákon

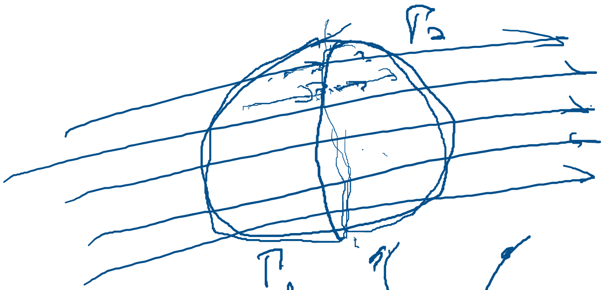
Difúzny tok

$$\operatorname{grad} c = \underbrace{i\frac{\partial c}{\partial x} + j\frac{\partial c}{\partial y} + k\frac{\partial c}{\partial z}}_{\nabla c}$$

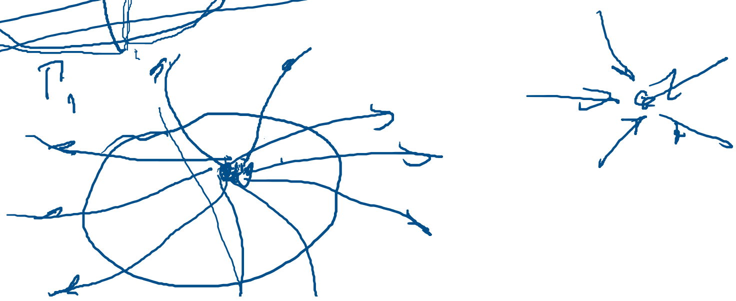
Tok $J$ cez $\delta\Gamma$ hranicu

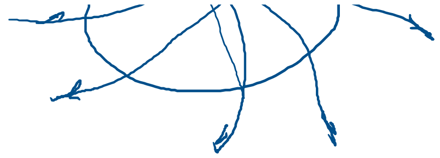


Tok cez plochu $\Phi = \oint_{\Gamma} \vec{J}\, d(\vec{\Gamma})$

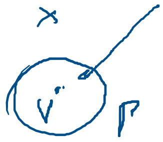


$$\Phi(\Gamma) = \underbrace{\Phi(\Gamma_1) + \Phi(\Gamma_2)}$$





divergencia vekt. poľa



$$\operatorname{div}\vec{J} = \lim_{\Gamma \to 0} \frac{\oint_\Gamma \vec{J}\, d\vec{\Gamma}}{V}$$

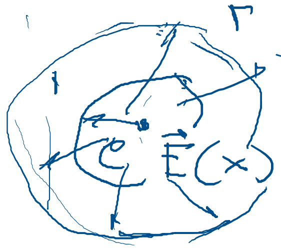
$$\operatorname{div}\vec{J} = \frac{\partial J_x}{\partial x} + \frac{\partial J_y}{\partial y} + \frac{\partial J_z}{\partial z} \qquad \vec{\nabla} \cdot \vec{J}$$

skalár!

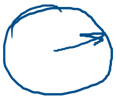
$$\boxed{\oint_\Gamma \vec{J} \cdot d\vec{\Gamma} = \int_V \operatorname{div}\vec{J}\, dV}$$

Gaussova veta

$\vec{J}$ $\vec{E}$



$$\vec{E}(x) = \frac{1}{4\pi\varepsilon} \frac{q}{r^2}$$

Sféra  $u$  $\frac{4}{3}\pi u^3 \overset{\text{hustota}}{\rho} = q$

$$4\pi r^2 \frac{q}{4\pi\varepsilon r^2} = \int \operatorname{div} E\, dV$$

$$\boxed{\operatorname{div} E = \frac{q}{\varepsilon}}$$

Guľa  $u$